CLAIMS

1. (currently amended) A method for code-tracking in a CDMA communication system[[s]], the method comprising:

(a) receiving [[of]] an electromagnetic signal (10) ~~being~~ comprising a superposition of a plurality of signal components of different signal paths [[(i)]] corresponding to a particular transmitted user signal that was spread with a particular code sequence,

(b) digitizing (14) the received signal (10,13),

(c) distributing the digitised signal (15) to a plurality of receiver fingers (1, 2, ... N) of a rake receiver, each ~~of which is~~ finger being assigned to a different one of the signal paths,

(d) distributing the digitised signal (110, 111) in each finger to a detection stream and a synchronizing stream,

(e) decorrelating (121, 122) the digitised signal [[by a]] in a first finger of the rake receiver corresponding to a first signal path using the particular code sequence (112) in the ~~synchronisation~~ synchronizing stream to generate a first decorrelated signal for the first signal path corresponding to the first finger, and

(f) reducing the interference of at least one other ~~(j ≠ i) than the~~ signal component ~~of the assigned signal path (i)~~ of at least one other signal path corresponding to at least one other finger of the rake receiver with the signal component of the ~~assigned~~ first signal path ~~(i) in at least one of~~ corresponding to the first ~~receiver~~ finger[[s;]] by:

[[(g)]] calculating the interference contribution of the at least one other finger [[j]] in the first finger [[i]]; and

[[(i)]] subtracting, for the first signal path [[i]], the interference contribution of the at least one other finger ~~(j ≠ i);~~ from an intermediate signal derived from the first decorrelated signal.

2. (currently amended) A method according to claim 1, wherein step[[s]] (f) ~~and (g)~~ further comprises the steps of:

~~computing~~ storing an S-curve for ~~transmission~~ the CDMA communication system[[;]] ~~storing the S-curve~~ in an interference computation module; and

calculating the interference contribution of the at least one other finger [[j]] in the first finger [[i]] by multiplying ~~the~~ a total weight of an interfering path ~~is subject to in finger i~~ corresponding to the at least one other finger by the S-curve at an estimated correct location.

3. (currently amended) A method according to claim 1 wherein the ~~subtraction~~ subtracting takes place on symbol rate (1/T).

4. (currently amended) A method according to claim 1, wherein interference of other signal components (j ≠ i) than the ~~assigned~~ first signal component (i) is reduced in all receiver fingers (1, 2, ... N).

5. (currently amended) A method according to claim 1, wherein step e) comprises decorrelating (121, 122) the digitised signal by multiplying the digitised signal with a complex-conjugate pseudo-noise code sequence (112).

6. (canceled)

7. (previously presented) A method according to claim 1, wherein after step f) the real part (118, x) of the interference reduced complex signal (y) is determined (126).

8. (previously presented) A method according to claim 1 wherein before step f) the real part (x) of the complex signal (116, y) is determined.

9. (currently amended) A method according to claim 1, wherein ~~wherein~~ after step f) the interference reduced signal (118, X) is filtered in a further step.

10. (previously presented) A method according claim 9, wherein steps e), f) and the filtering step provide code-tracking (101) of the digitised signal (111).

11. (currently amended) A method according to claim 10, wherein the code-tracking (101) provides an estimated timing delay ($\tau_k^{(i)}$) of the signal component of the first ~~assigned~~ signal path (i).

12. (currently amended) A method according to claim 1 wherein prior to step f) the digitised signal (111) is distributed to a first and second correlator (121, 122).

13. (currently amended) A method according claim 12, wherein the digitised signal (111) is time-shifted prior to feeding it to the second correlator (122) providing late and early estimates (113, 114) as output of the first and second correlators (121, 122) respectively.

14. (currently amended) A method according to claim 13, wherein the early and late estimates are subtracted (124) yielding [[an intermediate]] a difference signal ~~(117)~~.

15. (currently amended) A method according to claim 14, wherein the ~~intermediate~~ difference signal ~~(117)~~ is multiplied with reconstructed transmitted symbols (115) to generate the intermediate signal.

16. (canceled)

17. (currently amended) A rake receiver (17) according claim [[16]] 26, wherein the interference reduction device (131) comprises an interference computation module (132) being adapted to receive complex path weights ~~($c_k^{(i)}$)~~ ($c_k^{(j)}$) and path delays ($\tau_k^{(i)}$, $\tau_k^{(j)}$) to compute [[an]] the interference ~~signal~~ contribution of the at least one other signal component [[(j)]] with the said signal ~~path~~ component of the ~~assigned~~ first signal path [[(i)]].

18. (canceled)

19. (currently amended) A rake receiver (17) according to claim [[16]] 26, comprising an A/D-converter (14) upstream of the receiver fingers (1,2 ... N), for digitizing the received signal (10, 13).

20. (currently amended) A rake receiver (17) according to claim [[16]] 26, wherein the timing error detector (102) ~~comprises~~ is an early-late gate timing error detector further comprising a second correlator adapted to decorrelate another version (123) of the digitized signal to generate a second decorrelated signal, wherein the intermediate signal is generated based on the two decorrelated signals.

21-23. (canceled)

24. (currently amended) A rake receiver (17) according to claim [[16]] 26, wherein the timing error detector (102) is adapted to provide pseudo-noise (112) decorrelation (121, 122).

25. (currently amended) A rake receiver (17) according to claim [[16]] 26, which is adapted for direct-sequence code-division multiple access communication.

26. (new) A rake receiver (17) for processing a digitized signal (15) corresponding to a received electromagnetic signal (10) comprising a superposition of a plurality of signal components of different signal paths corresponding to a particular transmitted user signal that was spread with a particular code sequence, the rake receiver comprising a plurality of fingers, wherein a first finger is adapted to process a signal component corresponding to a first signal path, wherein the first finger comprises:

a detection path adapted to receive and process a first version (110) the digitized signal; and

a code-tracking loop (101) adapted to receive and process a second version (111) the digitized signal to determine a path delay error for the signal component corresponding to the first signal path, wherein the code-tracking loop comprises:

a timing error detector (102) adapted to generate error signals based on the second version of the digitized signal; and

a loop filter (103) adapted to filter the error signals from the timing error detector to generate the path delay error, wherein the timing error detector comprises:

a correlator (121) adapted to decorrelate the second version of the digitized signal using the particular code sequence to generate a decorrelated signal (113);

an interference reduction device (131) adapted to reduce the interference of at least one other signal component of at least one other signal path corresponding to at least one other finger of the rake receiver with the signal component of the first signal path corresponding to the first finger by:

calculating (132) the interference contribution of the at least one other finger in the first finger; and

subtracting (130), for the first signal path, the interference contribution of the at least one other finger from an intermediate signal (116) derived from the first decorrelated signal.

27. (new) A rake receiver according to claim 26, wherein the interference reduction device is adapted to:

store an S-curve for the CDMA communication system; and

calculate the interference contribution of the at least one other finger in the first finger by multiplying a total weight of an interfering path corresponding to the at least one other finger by the S-curve at an estimated correct location.

28. (new) A method according claim 1, wherein step (f) comprises using complex path weights ($c_k^{(j)}$) and path delays ($\tau_k^{(i)}$, $\tau_k^{(j)}$) to compute the interference contribution of the at least one other signal component with the signal component of the first signal path.

29. (new) Apparatus for code-tracking in a CDMA communication system, the apparatus comprising:

means for receiving an electromagnetic signal (10) comprising a superposition of a plurality of signal components of different signal paths corresponding to a particular transmitted user signal that was spread with a particular code sequence;

means for digitizing (14) the received signal (10,13);

means for distributing the digitised signal (15) to a plurality of receiver fingers (1, 2, ... N) of a rake receiver, each finger being assigned to a different one of the signal paths;

means for distributing the digitised signal (110, 111) in each finger to a detection stream and a synchronizing stream;

means for decorrelating (121, 122) the digitised signal in a first finger of the rake receiver corresponding to a first signal path using the particular code sequence (112) in the synchronizing stream to generate a first decorrelated signal for the first signal path corresponding to the first finger, and

means for reducing the interference of at least one other signal component of at least one other signal path corresponding to at least one other finger of the rake receiver with the signal component of the first signal path corresponding to the first finger by:

calculating the interference contribution of the at least one other finger in the first finger; and

subtracting, for the first signal path, the interference contribution of the at least one other finger from an intermediate signal derived from the first decorrelated signal.

30. (new) An apparatus according to claim 27, wherein the interference reducing means comprises:

means for storing an S-curve for the CDMA communication system in an interference computation module; and

means for calculating the interference contribution of the at least one other finger in the first finger by multiplying a total weight of an interfering path corresponding to the at least one other finger by the S-curve at an estimated correct location.

31. (new) An apparatus according claim 27, wherein the interference reducing means comprises means for using complex path weights ($c_k^{(j)}$) and path delays ($\tau_k^{(i)}$, $\tau_k^{(j)}$) to compute the interference contribution of the at least one other signal component with the signal component of the first signal path.